circularity of the non-cell components in the plurality of thresholded microscopy images.

6. The method of claim **1**, wherein the one or more sets of pixels are extracted from the plurality of microscopy images using a process comprising:

applying one or more machine learning models to identify the sets of pixels in the plurality of microscopy images; and

cropping the one or more sets of pixels from the plurality of microscopy images.

7. The method of claim **6**, wherein the machine learning models comprise one or more of a probabilistic boosting tree model and a deep CNN.

8. The method of claim **1**, wherein the deployment of the classifier comprises one or more files describing (i) the multi-layer architecture, (ii) the plurality of weights, (iii) the plurality of image quality labels.

9. The method of claim **1**, wherein the plurality of microscopy images are digital holographic microscopy (DHM) images.

10. The method of claim **1**, wherein the plurality of image quality labels consists of two values indicating an in-focus image or an out-of-focus image, respectively.

11. The method of claim **1**, wherein the plurality of image quality labels comprise a range of more than two values between a minimum value indicating poorest image quality and a maximum value indicating best image quality.

12. A computer-implemented method for performing adaptive focusing of a microscopy device, the method comprising:

acquiring a plurality of microscopy images depicting cells using a microscopy device;

extracting one or more sets of pixels from the plurality of microscopy images, wherein each set of pixels corresponds to an independent cell;

using a trained classifier to assign one of a plurality of image quality labels to each set of pixels indicating the degree to which the independent cell is in focus;

if the image quality labels corresponding to the sets of pixels indicate that the cells are out of focus, determining a focal length adjustment for adjusting focus of the microscopy device using a trained machine learning model; and

sending executable instructions to the microscopy device to perform the focal length adjustment.

13. The method of claim **12**, wherein the machine learning model is trained using (i) a set of training images, (ii) labels of focus quality, and (iii) an indication of focal length used in acquiring each training image.

14. The method of claim **12**, wherein the trained classifier is a convolutional neural network.

15. The method of claim **12**, wherein the microscopy device is a DHM device.

16. The method of claim **12**, wherein the plurality of image quality labels consist of two values indicating an in-focus image or an out-of-focus image, respectively.

17. The method of claim **12**, wherein the plurality of image quality labels consist of range of more than two values between a minimum value indicating poorest image quality and a maximum value indicating best image quality.

18. A system for performing adaptive focusing of a microscopy device, the system comprising:

a microscopy device configured to acquire a plurality of microscopy images depicting cells; and

one or more processors executing instructions for performing a method comprising:

extracting one or more sets of pixels from the plurality of microscopy images,

wherein each set of pixels corresponds to an independent cell;

using a trained classifier to assign one of a plurality of image quality labels to each set of pixels indicating the degree to which the independent cell is in focus;

if the image quality labels corresponding to the sets of pixels indicate that the cells are out of focus, determining a focal length adjustment for adjusting focus of the microscopy device using a trained machine learning model; and

sending executable instructions to the microscopy device to perform the focal length adjustment.

19. The system of claim **18**, wherein the one or more processors are included in a parallel processing platform that parallelize operations associated with use of the trained classifier.

20. The system of claim **19**, wherein the one or more processors apply the trained classifier to multiple sets of pixels in parallel.

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